

Another Strike of Litening for the MAGTF

EWS 2004

Subject Area General

Another Strike of LITENING for the MAGTF?
Submitted by: Captain M.R. Brubaker
CG #12, FACAD: Major P.L. Chandler
20 February 2004

Report Documentation Page				Form Approved OMB No. 0704-0188	
Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.					
1. REPORT DATE 2004		2. REPORT TYPE		3. DATES COVERED 00-00-2004 to 00-00-2004	
4. TITLE AND SUBTITLE Another Strike of Litening for the MAGTF				5a. CONTRACT NUMBER	
				5b. GRANT NUMBER	
				5c. PROGRAM ELEMENT NUMBER	
6. AUTHOR(S)				5d. PROJECT NUMBER	
				5e. TASK NUMBER	
				5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) Marine Corps War College, Marine Corps University, Marine Corps Combat Development Command, Quantico, VA, 22134-5067				8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)				10. SPONSOR/MONITOR'S ACRONYM(S)	
				11. SPONSOR/MONITOR'S REPORT NUMBER(S)	
12. DISTRIBUTION/AVAILABILITY STATEMENT Approved for public release; distribution unlimited					
13. SUPPLEMENTARY NOTES					
14. ABSTRACT					
15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT Same as Report (SAR)	18. NUMBER OF PAGES 15	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

INTRODUCTION

The Marine Corps' F/A-18 Hornet is often referred to as the jack of all trades, master of none. It is certainly true that the F/A-18 is capable of performing multiple missions, however, the most likely mission on today's battlefield is one that involves offensive air support (OAS), either close or deep (most likely both). Every aircraft executing OAS employs a forward-looking infrared (FLIR) pod to assist in the targeting process and provide a precision strike capability, as required by aviation platforms today. Targeting pods (also known as FLIRs) operate within the infrared light spectrum and allow aircrew to view the battlefield from significant altitudes beyond the human eye's range of vision. Although FLIR technology has made tremendous advances in the last decade, the Marine Corps' F/A-18 has not received the benefits of this increased technology. Therefore, a rapid integration of a 3rd generation FLIR pod for the F/A-18 Hornet is immediately necessary.

BACKGROUND

The F/A-18 Hornet currently carries the Lockheed Martin AN/AAS-38 Nighthawk pod. Although this targeting pod has received upgrades over the past few years, it is still considered a 1st generation FLIR and lacks several of the functions and capabilities inherent to 3rd generation FLIRs. For example, most 3rd generation FLIRs are equipped with a very

high resolution forward looking infrared camera, as well as a charge-coupled television which uses a camera as an electro-optical sensor. These cameras have a tremendous zoom capability and allow the pilot to view an object from a significant distance without distortion. Additional capabilities might include a laser spot tracker and laser designator, IR marker, and in some cases, a data-link capability. A data-link allows a pilot to broadcast a real time streaming video image to a ground station or hand held terminal carried by ground forces.¹ The latest capability of these 3rd generation FLIRs is the ability to generate coordinates for GPS guided weapons such as the Joint Direct Attack Munition (JDAM) and Joint Stand-Off Munition (JSOW).² Targeting pods that have these capabilities are extremely effective and accurate in combat. Most importantly, 3rd generation FLIRs provide aircrew and ground forces the ability to perform positive identification (PID), which reduces the possibility of collateral damage and fratricide.³

Although senior military officials are still reviewing after-action reports from the war with Iraq, the Navy and Marine Corps are getting an early start on incorporating aircraft enhancements for the next conflict.⁴ The future tactical aviation acquisition plans for both services include the modernization of Boeing F/A-18 strike fighters. A significant

addition that the Marine Corps is looking into is an infrared sensor upgrade for a small number of its two-seat F/A-18Ds.

Due to their two-crew cockpit, F/A-18Ds are ideal for missions such as strike coordination and reconnaissance (SCAR), armed reconnaissance (AR), and forward air controllers airborne FAC(A). While AR missions actually locate and attack targets of opportunity within an assigned area or route, SCAR missions acquire, report, and coordinate the destruction of targets.⁵ As a FAC(A) platform, F/A-18Ds have the ability to operate as an extension of the ground commander and provide terminal control to close air support aircraft. All of these missions require a high level of situational awareness and aircrew skill to be effective. 1st generation FLIRs add to the complexity of these missions and often cause targets to go un-serviced or cause undue delay in the PID process, therefore, wasting valuable time and fuel.

THE CURRENT SOLUTION

Designed as one of the sensors for the Navy's Super Hornet, the Advanced Targeting Forward Looking Infrared (ATFLIR) is the new Raytheon third-generation sensor, laser designator, and electro-optic camera.⁶ ATFLIR was one of the world's first 3rd generation FLIRs and was developed to help aircrew acquire targets from a greater distance with improved resolution. Additionally, the ATFLIR provides the ability to generate

precision targeting coordinates for GPS guided weapons.⁷ The planned acquisition for the ATFLIR is 526, in order to outfit the F/A-18 A/B/C/D and E/F aircraft.⁸ Potential limitations to the ATFLIR are its lack of an IR marker/designator and its inability to data-link information to ground personnel.

Due to the complex nature of integrating the ATFLIR into the F/A-18 aircraft weapon systems, the government turned to the McDonnell Douglas Corporation because of their expertise with the F/A-18 weapon systems.⁹ Unfortunately, the required funding was not available, and as a result, the sensor only met an initial operating capability (IOC) date of May 2002 for the F/A-18 E/F first deployment.¹⁰ That was great news for the Super Hornet community but did nothing for the older Hornets that are still operating with the Nighthawk.

LITENING FOR THE HARRIERS

Despite the lack of the ATFLIR for F/A-18C/D models, Marine aviation has become more lethal and effective thanks to the AN/AAQ-28 LITENING II targeting pod produced by Northrop Grumman. These targeting pods have been incorporated onto the Marines' AV-8B Harriers. According to LtGen Michael Hough, Deputy Marine Commandant for Aviation, "the Harrier is doing an absolutely amazing job in Afghanistan....[and with its] new Litening II Extended Range targeting pod, pilots are using the pods to provide up-to-the-minute intelligence to special

operations forces on the ground."¹¹ The LITENING pods have an IR designator, which has been used to confirm targets and minimizes the chances of fratricide. Pilots can place the IR designator on a target or any other significant object and that designation can be seen by anyone wearing night-vision devices.¹² This capability addresses the recommendation by the Marine Expeditionary Force to develop an air-to-surface combat ID system to prevent further unnecessary loss of life.¹³

LITENING CAPABILITIES

During Operation Iraqi Freedom (OIF), the Harriers employed two versions of the LITENING pod, the Extended Range (ER) pod and the Intelligence, Surveillance and Reconnaissance (ISR) pod.¹⁴ The ER version allowed the Harriers to engage targets from stand-off ranges while complying with rules of engagement (ROE) and positive identification (PID) procedures. The ISR version provided all the amenities of the ER pod but also incorporated the "real-time" video capability to ground personnel to aid in all around increased situational awareness.¹⁵

Harriers flew SCAR missions on a daily basis in OIF and used the LITENING pod to locate targets and in some cases, transmit images to ground personnel. According to MajGen James Amos, Commanding Officer of the 3rd Marine Aircraft Wing, "The Harrier's third-generation Flir-equipped targeting pod gave us a real edge in OIF."¹⁶ The Marines borrowed a data-link

transmitter from the Pioneer unmanned aerial vehicle and mounted it inside of the LITENING pod. This gave the Harriers the ability to transmit a video downlink from the LITENING to the forward air controllers and other personnel on the ground for real time viewing.¹⁷ This capability has proved successful in urban areas where ground units can view threats that may be hiding around structures or to confirm target locations between the FAC and the aircrew.¹⁸ In addition to this innovative technology, the LITENING II still features a forward looking infrared camera, a charged-coupled device TV, a laser spot tracker/rangefinder, an IR marker, and both a laser marker and designator.¹⁹ In summary, the LITENING II has every feature a pilot would ever desire on his/her aircraft.

A clear target identification system will always be paramount in today's combat zones. Because of rules of engagement (ROE) and collateral damage restrictions, the F/A-18's Nighthawk pod is unable to produce satisfactory image resolution for targeting.²⁰ Based upon feedback from F/A-18 squadrons that participated in OIF, existing targeting pods are inadequate and lack the critical capabilities necessary to be successful on the battlefield.²¹ These include the IR marker/designator, the ability to data-link information to ground personnel, as well as adequate target identification means to stay clear of threat envelopes.²² All of these

qualities are inherent to the Northrop Grumman LITENING targeting pod and will allow the F/A-18 to execute missions throughout the combat spectrum.²³

The LITENING II targeting pod first became operational on Israeli F-16s in 1998.²⁴ Since that time, the U.S. Air Force has adopted the targeting pod for its fleet of F-15Es, F-16s, A-10s, and most currently, the B-52H bomber.²⁵ In 1998, the Air Force decided they needed a precision strike capability for their reserve fleet of aircraft. Due to a small budget they decided on the LITENING II because of its lower cost and superior mission capability when compared to other products available.²⁶ The current price for each LITENING II is 1.5 million, whereas the cost for each ATFLIR is over 2 million per pod.²⁷

Northrop Grumman is currently producing the LITENING Advanced Targeting (AT) version, which is an improved version of the earlier LITENING II and LITENING (ER) models. The AT upgrade will include the enhanced image processing and precision target coordinate generation software, as well as the GPS weapon capability.²⁸ These advances/capabilities will allow aircrew to detect and track potential targets, and if necessary, employ highly accurate conventional and precision-guided weapons.

LITENING FOR THE HORNETS

Due to the successful employment of the LITENING by the Harrier in OIF, the Marine Corps has decided to pursue the LITENING for their F/A-18Ds. The immediate qualification, integration, and flight clearance of the LITENING on the F/A-18 will provide a more capable and flexible Marine Air Ground Task Force.²⁹ To fulfill this goal, the Marine Corps has put together a focus team to develop a plan to field the LITENING pod on a small number of F/A-18Ds in order to support current and near term deployments.³⁰ The purpose of this interim capability is to maintain ATFLIR compatibility, as well as minimize both hardware and software changes to both the pod and the aircraft.³¹ The initial effort is limited to 12 F/A-18Ds and can be ready within 60 days after the program is given the formal go ahead.³² The idea is that the Marines will not have to buy any more LITENING pods and will utilize the pods available to apportion the systems between the Harriers and Hornets.³³

CONCLUSION

It is time to pursue better capabilities for the Marine Corps' F/A-18 Hornet. The current integration plan is extremely cost effective and will result in increased capabilities for the overall Marine air package. The Hornet community cannot afford to wait around any longer for targeting pods to make their way through the political budgeting system. The Marine warfighting

capability has been deprived of technology that is available today and needs to ensure that Marine air platforms have the best equipment available to serve today's ever changing battlefields. To paraphrase MCDP 4, "we employ technology... to enhance the performance of our... personnel."³⁴

NOTES

¹ Robert Wall, "Eyes in the Sky Marines will Gain Real-Time Intel they had been Lacking, as Targeting Pod Video Capability is Added to AV-8Bs," *Aviation Week & Space Technology*, 31 March 2003, 57.

² Northrop Grumman, *Northrop Grumman Electronic Systems*, "AN/AAQ-28(V) LITENING AT, Low Risk, Next Generation Targeting Pod," Attachment to e-mail from Jeremy Rosenberg, Director of LITENING marketing for Northrop Grumman, to author, 24 November 2003.

³ L.F. Schram, LtCol, USMC, DC Aviation, Information Paper, subject: "AV-8Bs in Operation Iraqi Freedom (OIF)," 20 May 2003, Attachment to e-mail from LtCol Edward Barbour, USMC, F/A-18 TacAir division for DC Aviation, to author, 2 December 2003.

⁴ Robert Wall, "Assessing the War U.S. Experience Sparks F/A-18 Upgrade, Focus on Striking Moving Targets," *Aviation Week & Space Technology*, 16 June 2003, 163.

⁵ Department of the Navy, *MCWP 3-23 Offensive Air Support*, (Washington, DC: Headquarters, U.S. Marine Corps, 2001), 2-03.

⁶ Hunter Keeter, "Navy's Lessons From Afghanistan, Iraq Include Networked Tactical Aircraft," *C4I News*, 15 May 2003, 1.

⁷ Federation of American Scientists, "Advanced Targeting Forward Looking Infrared (ATFLIR)," Web-only report, URL: <<http://www.fas.org/man/dod-101/sys/smart/atflir.htm>> (14 December 2003).

⁸ Edward Barbour, LtCol, USMC, F/A-18 TacAir Division for DC Aviation, Targeting Pod Cost Analysis presentation, e-mail to author, subject: "ATFLIR Force Structure 2010 TacAir Integration Plan." 2 December 2003.

⁹ Federation of American Scientists, "Advanced Targeting Forward Looking Infrared (ATFLIR)."

¹⁰ Federation of American Scientists, "Advanced Targeting Forward Looking Infrared (ATFLIR)."

¹¹ Christian Lowe, "Bombers' Targeting Pods Mark Path for Special-Operations Forces," *Marine Corps Times*, 6 January 2003, 10.

¹² Mark Elfers, Capt, USMC, "Support the Harrier Transformation," *Proceedings*, October 2003, 49.

¹³ USMC 1 Marine Expeditionary Force, After-Action Report from Operation Iraqi Freedom, section heading: "Improved Combat Identification (ID) Equipment and Procedures," September 2003, 7.

¹⁴ LtCol Schram, e-mail attachment.

¹⁵ LtCol Schram, e-mail attachment.

¹⁶ Robert Wall, "F-18s Depend on AV-8B Litening Pod for Targeting," *Aviation Week and Space Technology*, 14 April 2003.

¹⁷ Edward Barbour, LtCol, USMC, Universal Need Statement (UNS): "Urgent request to replace inadequate targeting pods (Nighthawk) currently utilized by the F/A-18A/C/D aircraft."

¹⁸ Robert Wall, "Eyes in the Sky Marines," 57.

¹⁹ "Northrop Grumman wins LITENING II Contract," *Marine Corps Gazette*, October 2001, 6.

²⁰ USMC 1 Marine Expeditionary Force, After-Action Report from Operation Iraqi Freedom, section heading: "Upgrade Targeting Capability for USMC FA-18 Aircraft," September 2003, 37.

²¹ LtCol Barbour, Universal Need Statement (UNS).

²² LtCol Barbour, Universal Need Statement (UNS).

²³ Deputy Commandant for Aviation, NavAir PMA-265 Quick Reaction Assessment of AN/AAQ-28(V) (3) to Program Executive Officer (TacAir), Attachment to e-mail from LtCol Edward Barbour, USMC, to author, 2 December 2003, subject: "Requirement for AN/AAQ-28 (V) (3) Flight Clearance on FA-18," 3000, 4 April 2003.

²⁴ William B. Scott, "New Targeting Pods Deliver 'Litening Strikes': Long-range visible light CCD optics and third-generation Flir put reserves in the precision-strike game," *Aviation Week & Space Technology*, 21 August 2000, 56.

²⁵ Northrop Grumman, *Northrop Grumman News*, "U.S. Air Force Awards Northrop Grumman Second Contract For LITENING Advanced Targeting Systems," Attachment to e-mail from Jeremy Rosenberg, Director of LITENING marketing for Northrop Grumman, to author, 24 November 2003.

²⁶ Jim Miller, "Pilots Use New Targeting Pods to Bomb Iraqi Targets," *The Officer*, November 2000, 49.

²⁷ LtCol Barbour, "ATFLIR Force Structure," e-mail attachment.

²⁸ Northrop Grumman, *Northrop Grumman News*, "U.S. Air Force Awards Northrop Grumman."

²⁹ Deputy Commandant for Aviation, e-mail attachment.

³⁰ Edward Barbour, LtCol, USMC, F/A-18 Litening Focus Team presentation, subject: "Program Approach Summary."

³¹ Stephen Trimble, "NAVAIR Wants Litening Pods for Marine F/A-18Ds," *Aerospace Daily*, 17 July 2003.

³² Robert Wall, "Assessing the War," 163.

³³ Robert Wall, "Assessing the War," 163.

³⁴ Department of the Navy, *MCDP 4 Logistics*, (Washington, DC: Headquarters, U.S. Marine Corps, 1997), 113.

BIBLIOGRAPHY

- Barbour, Edward, LtCol, USMC, F/A-18 TacAir division for DC Aviation. Targeting Pod Cost Analysis presentation. Subject: "ATFLIR Force Structure 2010 TacAir Integration Plan."
- Barbour, Edward, LtCol, USMC, F/A-18 TacAir division for DC Aviation. F/A-18 Litening Focus Team presentation. Subject: "Program Approach Summary."
- Barbour, Edward, LtCol, USMC, F/A-18 TacAir Division for DC Aviation. Universal Need Statement (UNS): "Urgent request to replace inadequate targeting pods (Nighthawk) currently utilized by the F/A-18A/C/D."
- Department of the Navy. *MCWP 3-23 Offensive Air Support*. Washington, DC: Headquarters, U.S. Marine Corps, 2001. 2-03.
- Department of the Navy. *MCDP 4 Logistics*. Washington, DC: Headquarters, U.S. Marine Corps, 1997. 113.
- Deputy Commandant for Aviation. NavAir PMA-265 Quick Reaction Assessment of AN/AAQ-28(V) (3) to Program Executive Officer (TacAir). Attachment to e-mail from LtCol Edward Barbour, USMC, F/A-18 TacAir division for DC Aviation, to author, 2 December 2003. Subject: "Requirement for AN/AAQ-28 (V) (3) Flight Clearance on FA-18," 3000. 4 April 2003.
- Elfers, Mark. Capt, USMC. "Support the Harrier Transformation." *Proceedings*. October 2003. 48-51.
- Federation of American Scientist. "Advanced Targeting Forward Looking Infrared (ATFLIR)." Web-only report. URL: <<http://www.fas.org/man/dod101/sys/smart/atflir.htm>> (14 December 2003).
- Keeter, Hunter. "Navy's Lessons From Afghanistan, Iraq Include Networked Tactical Aircraft." *C4I News*. 15 May 2003. 1.
- Lowe, Christian. "Bombers' Targeting Pods Mark Path for Special-Operations Forces." *Marine Corps Times*. 6 January 2003. 10.
- Miller, Jim. "Pilots Use New Targeting Pods to Bomb Iraqi Targets." *The Officer*. November 2000. 49-50.
- Northrop Grumman. *Northrop Grumman Electronic Systems*. Subject: "AN/AAQ-28(V) LITENING AT Low Risk, Next Generation Targeting Pod." Attachment to e-mail from Jeremy Rosenberg, Director of LITENING marketing for Northrop Grumman, to author, 24 November 2003.

Northrop Grumman. *Northrop Grumman News*. Subject: "U.S. Air Force Awards Northrop Grumman Second Contract For LITENING Advanced Targeting Systems." Attachment to e-mail from Jeremy Rosenberg, Director of LITENING marketing for Northrop Grumman, to author, 24 November 2003.

"Northrop Grumman wins LITENING II Contract." *Marine Corps Gazette*. October 2001. 6.

Schram, L.F. LtCol, USMC, DC Aviation. Information Paper. Subject: "AV-8Bs in Operation Iraqi Freedom (OIF)." 20 May 2003. Attachment to e-mail from LtCol Edward Barbour, USMC, F/A-18 TacAir division for DC Aviation, to author, 2 December 2003.

Scott, William B. "New Targeting Pods Deliver 'Litening Strikes': Long-range visible light CCD optics and third-generation Flir put reserves in the precision-strike game." *Aviation Week & Space Technology*. 21 August 2000. 56.

Trimble, Stephen. "NAVAIR Wants Litening Pods for Marine F/A-18Ds." *Aerospace Daily*. 17 July 2003.

USMC 1 Marine Expeditionary Force. After-Action Report from Operation Iraqi Freedom. Section heading: "Improved Combat Identification (ID) Equipment and Procedures." September 2003. 7.

USMC 1 Marine Expeditionary Force. After-Action Report from Operation Iraqi Freedom. Section heading: "Upgrade Targeting Capability for USMC FA-18 Aircraft." September 2003. 37.

Wall, Robert. "Assessing the War U.S. Experience Sparks F/A-18 Upgrade, Focus on Striking Moving Targets." *Aviation Week & Space Technology*. 16 June 2003. 163.

Wall, Robert. "Eyes in the Sky Marines will Gain Real-Time Intel they had been Lacking, as Targeting Pod Video Capability is Added to AV-8Bs." *Aviation Week & Space Technology*. 31 March 2003. 57.

Wall, Robert. "F-18s Depend on AV-8B Litening Pod for Targeting." *Aviation Week & Space Technology*. 14 April 2003.